Cnephalia and its Allies.

BY W. A. SNOW.

"Diese Gattung bedarf einer Revision. Für *Cnephalia* hat der Name *Spallanzania* Rond. einzutreten"*—A not inappropriate text for some observations on the characters assigned to these genera by Messrs. Brauer and Bergenstamm.

Let us first review the history of *Cnephalia* and *Spallanzania*.

In 1830 Robineau-Desvoidy divided the old genus *Gonia* into several genera founded on slight differences of the antennal joints.† One of these, *Spallanzania*, he separated from two others as follows: "Characters of *Rhedia* and *Reaumuria*: antennæ placed in a little deeper depression, second joint longer than in *Rhedia* and shorter than in *Reaumuria*; second joint of arista straight. Facial ridges not ciliate; color black." He described two species, *picea* and *gallica*, of which the first is unknown and the second is a synonym of *Gonia hebes* (Fall.) Meig., Schin., Zett., Kowarz, et al.

The genus *Cnephalia* was erected by Rondani with *hebes* as the type species.‡ He redefined *Spallanzania* and described several species having the third antennal joint twice as long as the second, while in *Cnephalia* the third joint was scarcely as long as the second; and having the second aristal joint elongate, while in his *Cnephalia* species it was very short.

Schiner, who examined typical examples of *Cnephalia* received from Rondani, retained the genus, but recognized in *hebes* not the *hebes* of Fallen, but *Tachina bucephala* Meigen. He therefore regarded *Cnephalia bucephala* as the type of the genus. He speaks thus positively: "Sonderbarer Weise ist seine typische Art: *C. hebes* Meigen von Rondani verkannt worden, und in der That nichts Anderes als *Tachina bucephala* Meigen" § "The true *hebes* Fallen, Meigen," he restored to *Gonia*. The part of Rondani's Prodrome which contained the recharacterization of *Spallanzania* Rob.-Desv. was published about the same time as volume I of Schiner's Fauna Austriaca, and it is probable that the latter author had not seen it, since he mentions the genus only in the sense of Robineau-Desvoidy.

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* Brauer and Bergenstamm, Muscaria Schizometopa, Pars. II, p. 353.
† Myodaires, p. 79-82.
‡ Ditt. Ital. Prodr., III, 39.
§ Fauna Anstr. I, p. 445.

Kowarz, in a review of the European species of Gonia[*] adds to the synonymy of *Gonia hebes*, *Spallanzania cognata* Rond., and *S. alpestris* Rond. He does not mention Rondoni's *hebes*, which would indicate that he agreed with Schiner that it was *Cnephalia bucephala* Meig. He says in his introduction that the genus *Spallanzania* R.-D., which in distinction from *Gonia* Meigen was founded upon the shortness of the second joint of the arista, is not tenable, because of the inconstancy of this character; and credits Dr. Williston with having previously make a similar observation regarding the inadequacy of this character for separating species.[†]

Van der Wulp about this time made a strenuous attempt to clear away the obscurity surrounding the species *hebes*, when he declared[‡] that *Gonia hebes* (Fallen) Meigen, *Cnephalia hebes* Rond. and *C. bucephala* Schiner (non Meigen) were synonyms, and called the species after Rondani, *Cnephalia hebes*. Thus, though Schiner stated positively that Rondani did not have the true *hebes*, but instead *bucephala* Meigen, v.d.Wulp believes that Rondani was correct and that Schiner, besides misconstruing *bucephala*, was guilty of distributing specimens of the same species to different genera. What a blessing to the poor muddled student of today if this synonymy could be accepted without question! But, alas, the researches of later writers have only added to the confusion.

Brauer and Bergenstamm, during the writing of their recent great work, have been induced to change their minds several times in regard to the ill-fated *hebes*. They first follow[§] Schiner and recognize *Cnephalia bucephala* (Meigen) Schiner as a valid species and the type of the genus. Later,[||] an examination of the specimens under that name in the Schiner collection results in assigning them to three different species, as follows: *C. multisetosa* Rond., *C. bisetosa* B. B. nov. and *Spallanzania hebes* Rond. A male to which they gave the first name has the second aristal joint but little longer than broad, and the third antennal joint shorter than the second. A female, the type of *bisetosa*, has a similarly shortened second aristal joint and the third antennal joint one and one-third times the length of the second. The third form is referred to *Spallanzania* because the second aristal joint is three or four times as long as thick, and the third antennal joint is twice as long as the second. In this last species they recognize the *hebes* of Rondani. It then follows that *hebes* Rond. is distinct from *hebes* Fall. and the former, which was the type of *Cnephalia*, does not belong to that genus, but to *Spallanzania* in the sense of the author of *Cnephalia!* *Hebes* Fallen, placed in *Gonia* by Meigen, Schiner, Kowarz and v.d.Wulp, is removed by Brauer and Bergenstamm* to their new genus *Pseudogonia*, the type of which is *Gonia cinerasens* Rond. This genus is distinguished† from *Gonia* by the elongated claws and pulvilli, and the lack of orbital bristles in the male. It is said to differ from *Spallanzania* Rond. only in these very feeble characters; arista geniculate, second joint almost as long as the third; while to *Spalanzania* are imputed: arista not geniculate, second joint much shorter than the third. These statements, based upon a minute analysis of Schiner's specimens, are apparently decisive, and we are hardly prepared for the later declaration of Brauer and Bergenstamm, at the end of Part III, in a supplement to the alphabetical index to Part II, that "*hebes* Fallen (*Gonia*)=*Cnephalia bucephala* Schiner, teste P. Stein. Type Fallen Coll. Lund.=*bisetosa* n." It would seem that the authors omitted *pt.* after the name *bucephala* Schiner. Otherwise it would appear that *Gonia* (*Pseudogonia*) *hebes* Fall. is a "Mischart" of the three species above mentioned, as stated by these authors. If *parte* be inserted, the synonymy would read *Gonia hebes* Fall.=*Cnephalia bisetosa* B. B., which, after all, bears a very decided resemblance to that slighted synonymy of v.d.Wulp's: *hebes* Fall.=*hebes* Rond.=*bucephala* Schiner.

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[*] Wien. Ent Zeit. vii, Jan.. 1888, p 1.

[†] North American Tachinidæ. Canadian Entom. xix, p. 6.

[‡] Biol. Centr.-Amer Dipt. II, p. 45.

[§] Musc. Schiz. Pars I, p 103, 1889.

[||] L. c. Pars II, p. 353, 1891.

To sum up briefly:

In 1851 Rondani called *Gonia hebes* the type of his genus *Cnephalia*.

In 1862, Schiner declared that *hebes* Rond. was not *hebes* Fall., but a synonym of *bucephala* Meig.

In 1888 v.d.Wulp made *hebes* Rond. and *bucephala* Schin. (non Meig.) synonyms of *hebes* Fall.

In the same year Kowarz did not mention *hebes* Rond. in a treatise on *Gonia*, and the inference is that he agreed with Schiner.

In 1889, Brauer and Bergenstamm followed Schiner in considering *hebes* Rond. as a synonym of *bucephala* Meig.

In 1891 the latter authors placed *hebes* Fall. along with *cinerascens* Rond. in their new genus *Pseudogonia*, and maintained that *C. bucephala* Schin. was in reality equivalent to three species: *C. multisetosa* *C. bisetosa* B. B., and *Spallanzania hebes* Rond.

In 1893, the same authors in Part III, p. 222, give this synonymy: *hebes* Fallen=*bucephala* Schiner=*bisetosa* B. B.‡ and place the species in the genus *Cnephalia* instead of *Pseudogonia*.

It need hardly be said that few other species in the family have been so misunderstood and received so many names as has the present one. Six generic and eight specific names have been applied to it. The genera are the old composite genus *Tachina*, *Gonia*, *Spallanzania*, *Isomera* R.-D. (=*Gonia*), *Cnephalia* and *Pseudogonia*.

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* L. c. Pars II. p. 404.
† L. c. Pars III. p. 125. 1893.
‡ On p. 125 of the same part, *bisetosa* is spoken of as a distinct species.

As a further introduction to a discussion of some of the generic characters used to distinguish *Gonia* and related genera, I will insert a slightly modified translation of Brauer and Bergenstamm's table of their Section Gonia as follows:—

Head swollen, front and cheeks broad, ocellar bristles reclinate, arista distinctly three jointed, often geniculate, the second joint more or less elongate; vibrissæ not ascending above the middle of the face; first posterior cell ending before the tip of the wing. Section Gonia.

1.—Proboscis normal 2
Proboscis strongly elongate, setiform....... Rhynchogonia B. B.

2.—Claws of male and female short; arista distinctly three-lointed, geniculate, two orbital bristles in each sex; third joint of antennæ in each sex longer than the second...... Gonia Meigen.
Claws of male elongate, sometimes only of the front feet...... 3

3.—Arista geniculate, first joint short, second elongate, almost as long as the third; no orbital bristles in the male, in the female two.................................. Pseudogonia B. B.
Second joint of the arista much shorter than the third, arista rarely geniculate (female).............................. 4

4.—Orbital bristles in each sex two............. Onychogonia B. B.
Orbital bristles in the male none, in the female two; second joint of the arista much shorter than the third, arista not geniculate, 5

5.—Third joint of antennæ twice as long as the second; second joint of the arista three or four times longer than wide. Spallanzania Rond.
Third joint of antennæ shorter than the second (male), or a little longer (male, female). Second joint of arista hardly longer than wide, a little thickened................ Cnephalia Rond.

He also adds that *Eucneahalia* Towns. is near *Spallanzania* if it has reclinate ocellar bristles. An examination of the type shows that these are present.

GONIA.

With regard to the characters assigned above to *Gonia*, the first one which is given the distinctive position in the table, is by no means constant, as has been observed by Williston in the work previously cited on *Gonia*, wherein he says, speaking of *Gonia exul* Will., that certain males from California which he could not separate, had the claws and pulvilli very large. I have these specimens now before me, as well as other long-clawed males from Estes Park, and Manitou Park, Colorado, of the same species. The species has the third antennal joint about five times as long as the second, the second aristal joint longer than the third and strongly geniculate; and with but two marginal macrochætæ on each of the first two segments of the abdomen Moreover, several males from the Magdalena Mts., New Mexico, have strikingly elongate claws and pulvilli, but otherwise agree with the types of *Gonia sequax* Will. Dr. Williston, in an article on *Belvosia* * has shown in drawings of the front feet of nine specimens a great variation in the length of the claws in both sexes. *Belvosia* is an allied form and the comparison is pertinent. It would appear to me that the protuberant front is a more available character for the genus *Gonia*.

CNEPHALIA.

The relationship between *Cnephalia* Rond., *Pseudogonia* B. B. and *Spallanzania* in the sense of Rondani, and Brauer and Bergenstamm, must be a very intimate one. By consulting the table of genera, it will be seen that *Cnephalia* and *Spallanzania* differ from *Pseudogonia* in having the arista straight, and a longer second aristal joint. *Cnephalia* differs from *Spallanzania* only in the third antennal joint being shorter in proportion to the length of the second, and in a shorter second aristal joint. The study of a large series of American "Goniidæ" convinces me that these characters, including the geniculation of the arista, are entirely too variable and unreliable for the differentiation of the genera of the group. This, I trust, will be apparent in the descriptions further on. While I, unfortunately, have not seen European specimens, my opinion, based upon the American material and a study of the European literature, is that *Pseudogonia* and *Spallanzania* must be included in *Cnephalia*.

In the University collection there are specimens which I have assigned to *Cnephalia* under three species. A study of these will explain why I have rejected certain characters regarded as generic by many writers, and which I believe are not even of specific value. The three forms have in common the following characters: Robust form and cinereous color; head broad, a little swollen in front, but much less so than in all the species of *Gonia* which I have seen; front and sides of the face wide, both of which are of nearly equal width in the female, but the former narrowed above in the male. Ocellar bristles reclinate; orbital bristles wanting in the male, but present in the female; two rows of bristles on each side of the front; sides of face beset with small bristles; first two joints of the antennæ reddish, third joint black; arista three-jointed; proboscis long and slender with small labellæ; palpi cylindrical, slightly enlarged at the tip, yellow. Thorax with four black stripes; scutellum testaceous.

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* Insect Life, v, p. 238.

Abdomen with broad, cinereous pollinose bands and blackish reflections; first segment without marginal bristles (rarely aborted ones in the male); second segment with two marginal bristles; third segment with a marginal row. Claws of male elongate; tibia of hind legs on the front side with a fringe-like row of bristles, a little longer on the basal half. First posterior cell open, ending before the tip of the wing.

Cnephalia pansa n. sp.

Female. Thickly cinereous pollinose, with a faint yellowish tinge. Front and face almost equally wide, the former very slightly narrower, one-half the width of the head; silvery pollinose; frontal stripe brownish; in addition to the frontal bristles there are many dark hairs, especially near the vertex, and a row of very small bristles along the orbits. Sides of faces silvery pollinose, as wide as the depression, beset with many small, irregularly arranged bristles. Facial ridges bare, except for some weak bristles above the vibrissæ, which extend from one-fourth to one-half the distance to the base of the antennæ. The ground-color of the face, and less preceptibly of the front, except near the eyes, is testaceous, which is most apparent at the facial depression and at the epistoma. Third joint of antennæ sometimes reddish at the immediate base, equal in length to the second, or from one-fourth to three-fourths longer than the second. Arista sometimes straight, but usually geniculate, though rarely are the two aristas of a specimen bent at the same angle; second joint of the arista from one to three times its width in length. Sides of abdomen sometimes reddish or luteous; tip of abdomen red or not.

Nineteen specimens, Las Cruces, New Mexico (Coll. Towns., July 9—28).

Three males, Las Cruces, New Mexico (Coll. Towns., May 8) Magdalena Mts., New Mexico (F. H. Snow, Aug. 9500 ft.), Western Kansas have the third antennal joint slightly more than twice the length of the second and the second aristal joint three to four times its own width; the front perceptibly narrowed toward the vertex where it is more than one-third the width of the head. Though two of these specimens show two weak median macrochætæ on the first abdominal segment, I do not doubt that they are conspecific with the females and the other male.

Length, 10—12 mm.

This species differs from Shiner's descriptions of *Cnephalia hebes* and *C. americana** in having the bristles on the sides of the face arranged irregularly (not "reihenweise geordnet"); and from

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* Reise der Novara, p. 327.

Kowarz's description of *hebes* in having five cinereous stripes on the thorax instead of four. The female, too, is often testaceous on the sides and tip of abdomen.

Cnephalia ruficauda Towns.

Pseudogonia ruficauda Towns. Canad. Entom. XXIV, p. 66.

Pseudogonia obsoleta Towns. l. c.

Male and female. In appearance markedly similar to the preceding. The size is the same, the color is darker owing to a thinner covering of cinereous pollen. Front widely on the sides brassy-yellow pollinose, bristles much coarser and longer than in the preceding; front of the male one-third of the width of the head, of the female a little wider, in both sexes perceptibly narrowed toward the vertex. The facial depression is wider than in *pansa* and at its widest is nearly one-half of the facial width; its ground color is black above the epistomata directly beneath the antennæ; sides of the face beset with small black bristles arranged in two rows, one of which follows the orbit and the other lies near the facial ridges diverging below towards the orbital row. In the males the third joint of the antennæ is from one and one-third to four times the length of the second joint, with an average of two and one-third times; in the females the third joint is from one and one-half to one and one-third times the second. In the males the second aristal joint is from three to six times as long as wide, with an average of four times; in the females it is from two and one-half to three times its width. In both sexes the arista may be strongly geniculate or not at all, or the arista of one antenna may be geniculate, while that of the other antenna may be perfectly straight; the arista is generally incrassate in the male and feebly so or not at all in the female. In the males the bristles of the facial ridges ascend above the vibrissæ from five-tenths to eight-tenths the length of the ridges, with an average of six-tenths; in the females they ascend from three-tenths to six-tenths the length of the ridges, average four-tenths. Both sexes vary as to the amount of red on the fourth abdominal segment, a few specimens showing not a trace and others a narrow ring at the tip, while not infrequently the ground color of nearly the whole segment is red.

Ten males and two females, Illinois (Prof. Forbes, Nos. 14,504, 14,566, 14,460—Coll. Townsend), seven males and one female, Southern Illinois (Charles Robertson, Nos. 1630, 1634, 2922, 5444, 6430, 6432—Coll. Williston); one male, Riley county, Kansas, (F. A. Marlatt, in June—Coll. Towns.); two females, White Mountains (Williston); one female, Newton, Mass., (Williston, in July); one male, North Carolina, (Coll. Williston); one male, New York, (Comstock); two males, Brookings, South Dakota, (Aldrich).

One of the males from South Dakota is the type of *Pseudogonia ruficauda* Towns.; the male from New york is the type of *P. obsoleta* Towns.; the male from Kansas bears the label *Acroglossa hesperidarum* Will. (See below, *Acroglossa*) Concerning the type of *obsoleta* Prof. Townsend says: "[It] differs chiefly [from *ruficauda*] in the anal segments being wholly black at tip, not at all rufous; the third antennal joint blackish, rufous at base, arista brown."

Cnephalia finitima n. sp.

Four males and six females from Las Cruces, N. M. (Coll. Towns., July 3—Sept 20) were at first confounded with the preceding species, which they greatly resemble. However, they differ in the much smaller size of the frontal bristles, the greater width of the front and the sides of the face, and correspondingly narrower facial depression. *C. ruficauda* has a bright brassy color on the sides of the front, while in the present species they are cinereous with a slight yellowish or brownish tinge. The third joint of the antennæ in the males varies in length from two to two and a half times the length of the second joint; in the females from one and one-third to one and two-thirds the length of the second. The second joint of the arista varies in the males from three to six times its own width; in the females from one and a half to five times its width. The bristles of the facial ridges ascend in the male from one-half to three-fourths the distance to the root of the antennæ; in the females from three-tenths to six-tenths. Two of the males show no red on the fourth abdominal segment, while all of the females show at least a narrow margin of red at the tip. The arista in both sexes may be geniculate or not; it can hardly be called incrassate, except in one of the males. A single male has a weak marginal bristle on the first segment.

Thus from examination of my material in these Gonia-like genera it appears that the third antennal joint is generally much shorter, and the second joint much longer in the female than in the male; the second aristal joint is not as long in the female as in the male, and the cilia of the facial ridges reach higher in the male than in the female. It is also seen that some males may have much shorter ungues than other males of the same species.

I feel no hesitancy in declaring my belief, formed in the study of other groups of this family, before examination of these specimens, that the relative length of the antennal joints, the relative length, the width and the degree of geniculation of the aristal joints, the extent to which the facial ridges are invaded by bristles, the presence or absence of a sparce ocular pubescence and the closure of the first posterior cell at or near the margin of the wing, are characters which are at best of secondary importance in the separation of species, and inconsequential in the extreme in the separation of genera. The character derived from the length of the claws must also be used with very great caution.

On such inadequate characters many genera have been established by recent authors. As a result a beginner is often in doubt whether he has before him a male and female of a species of *Phorocera*, or *Cnephalia* for example, or has representatives of two different genera belonging to two subfamilies.

EUCNEPHALIA.

The genus *Eucnephalia* Towns., placed in the "Phoraceratinæ" by the author, probably belongs to this group, as suspected by Brauer and Bergenstamm. The typ especies, *gonioides*, differs from other species of the group which I have seen in its short proboscis, furnished with rather thick labellæ. Its first abdominal segment bears a pair of strong marginal bristles; the third antennal joint is at least four times as long as the second; the second aristal joint is hardly two times as long as it is wide. The bristles of the facial ridges ascend a little above the middle of the face. The ocellar bristles are reclinate.

ACROGLOSSA.

The genus *Acroglossa* Williston * has been confounded with *Spallanzania* by Messrs. Brauer and Bergenstamm † who have misunderstood the direction of the ocellar bristles in the figure given by the author. They are directed forward and outward in both sexes, as stated in the description. Giglio-Tos‡ has recently described a Mexican species, which he refers to *Acroglossa*. It is interesting to note that the ocellar bristles in his species are proclinate. Brauer and Bergenstamm's further statement (l. c.): "The genus cannot be compared with *Fontina* on account of the lack of ascending bristles on the facial ridges," is also expressly contradicted in both description and plate. It is therefore evident that these last named authors had no example of the genus before them. Had they had specimens with proclinate bristles, so great is their respect for this character, they would certainly have located the genus in another group.

In the Townsend Collection is a specimen of *Cnephalia ruficauda* Towns. bearing Prof. Townsend's label "*Acroglossa hesperidarum* Williston" and the locality label "Riley Co., Kans." It is doubtless the one spoken of by him in Trans. Amer. Ent. Soc. xviii, p. 367, as agreeing with Dr. Williston's description. This insect, however, differs from *Acroglossa* in the direction of the ocellar bristles, which are turned backwards; otherwise it seems to agree well with the description of *A. hesperidarum.* Brauer and Bergenstamm place much stress on this character. To illustrate, they erect the genus *Cnephaliodes* for the reception of a specimen which was a *Cnephalia* in all respects except the direction of the ocellar bristles. In the present instance I do not know whether *Acroglossa* should be united with *Cnephalia* or not. Though I have not seen the types of *Acroglossa,* it is evident from the description that this ocellar-bristle character is all that separates the two genera. In my experience, this character is not a variable one. I find but three specimens in the series of Cnephalia-like forms which have the bristles proclinate, and these have also short, stout proboscides, with large labellæ. In *Gonia* these bristles are regularly curved backwards.

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* Scudders Butterflies of New England, p. 1916.
† L. c Pars. ii, p. 351.
‡ Ditt. del Messico, Pars. iii, 1894. p. 34,

In conclusion, what has been said in the foregoing pages will at least indicate how much we have yet to learn before we can correctly appreciate the relative values of the structural characters of the Tachinidæ. To the non-dipterological entomologist it may seem surprising that the presence or absence of a mere bristle, or even the direction toward which a bristle is turned may serve to distinguish not only species and genera, but even groups of genera, but the student of Tachinidæ is almost prepared to base species and genera upon a single hair.